

REMARKS/ARGUMENTS

The amendment to Claim 15 corrects an inadvertent typographical error. No new matter has been entered.

Applicants appreciate the withdrawal of the previous rejections.

All of the newly presented rejections rely on at least the combination of Heikonen and Hei and the theory that it would have been obvious to replace the formic acid in Heikonen with benzoic acid. See, e.g., page 4, lines 1-4, of the Official Action. Applicants respectfully submit that this fundamental premise is incorrect.

Heikonen, as recognized in the Official Action, relies on formic acid to run at a pH of 3.5 to 4.0. See, e.g., the Abstract, page 2, lines 21-27, page 4, lines 15-17, page 5, lines 45-46, page 6, lines 33-35 and page 7, lines 20-25. This pH is attainable with formic acid because formic acid has a pKa of 3.77.¹ Because $\text{pH} = \text{pKa} + \log([A^-]/[HA])$, at equilibrium the pH of formic acid is the pKa, which is 3.77. Benzoic acid, on the other hand, has a pKa = 4.2. Thus, while benzoic acid is suggested as useful in providing a simple antimicrobial effect on surfaces, etc., in Hei, benzoic acid is significantly less acidic than formic acid and, importantly, has substantial solubility problems (due to its hydrophobic nature) as compared to formic acid. Indeed, formic acid is miscible with water and can thus be used as highly concentrated aqueous solutions as taught in Heikonen (concentrations of 60+%, to provide a pH of 4 or less in the described AIV process; see, e.g., the Abstract, page 2, lines 6-8 of Heikonen, and page 4, lines 15-17). On the contrary, benzoic acid has a solubility of only 0.34 g/100ml and could thus not be used as a concentrated aqueous solution. Accordingly, benzoic acid could not provide the highly acidic pH provided by formic acid in the different setting of Heikonen, which is necessary to the process therein.

¹ See, e.g., http://en.wikipedia.org/wiki/Carboxylic_acid or <http://www.zirchrom.com/organic.htm>

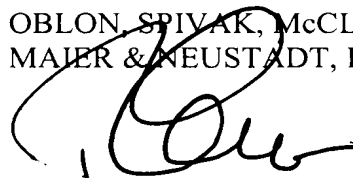
McNeff does not cure the deficiencies in Heikonen either, as the formic acid in Heikonen is not used therein as a preservative as such, but rather as a severely aggressive, acidic digesting agent used to defiberize cellulosic raw material and, thereafter, for its acidic properties, at concentrations of 60+%, to provide a pH of 4 or less in the described AIV process (see, e.g., the Abstract, page 2, lines 6-8 of Heikonen, and page 4, lines 15-17). Moreover, and noteworthy herein, McNeff *replaces* preservatives like benzoic acid with hydrogen peroxide. See, e.g., para. [0011].

The other tertiary, etc. references cited against the claims also fail to make up for that lacking in Heikonen, Hei and McNeff. For example, Koenig is similar to McNeff in that it discloses, at best, preservatives, which would not be considered as equivalent to the formic acid in Heikonen in either function or effect as described above and thus not candidates for the replacement thereof. Rossmore and Nakanish are similarly cited as disclosing disinfectants, etc. not pertinent to the deficiencies noted above for the primary and secondary references.

Accordingly, and for the reasons presented above, Applicants respectfully submit that none of the reference combinations applied against the claims present a *prima facie* case of obviousness thereagainst, and Applicants thus request the reconsideration and withdrawal of the outstanding rejections and the passage of this case to Issue.

Respectfully submitted,

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